

REMARKS

By this Amendment, Claims 10, 17, 20, 22 and 30 have been amended. Claims 1-5, 7-14, 16-25 and 28-30 are pending in the application. No new matter is added by the amendments. Favorable consideration and allowance are respectfully requested in light of the following remarks.

Restriction Requirement

Claim 22 has been amended to recite every feature of Claim 1. In accordance with the provisions of M.P.E.P. § 821.04(d), once Claim 1 is found allowable, Claims 22-25 should be rejoined.

Objections to Drawings

In the Amendment filed on December 11, 2006, Applicants fully addressed each of the objections to the drawings under 37 C.F.R. § 1.84(p)(4) that were set forth in the Official Action dated August 9, 2006. However, in the January 25, 2007 Official Action, the same objections are repeated verbatim and Applicants comments presented in the December 11, 2006 Amendment were not addressed.

For example, as explained in the December 11, 2006 Amendment, Applicants submitted a proposed amendment to Figure 10 of the drawings with the Amendment filed on May 12, 2006, in which reference number "133" was added to indicate the location of the "upper portion" 133 of the fastener 130. However, the Office has not yet informed Applicants whether this proposed drawing amendment is acceptable. Applicants respectfully request that the Office indicate whether amended Figure 10 has been accepted in the next Office communication.

Furthermore, 37 C.F.R. § 1.84(p)(4) states that:

The same part of an invention appearing in more than one view of the drawings must always be designated by the same reference character, and the same reference character must never be used to designate different parts (emphasis added).

This rule refers to the contents of the drawings. Applicants have not, however, used the same reference character to designate different parts shown in the drawings. For example, the Office asserts that the reference number "12" is used to designate both the "second member" and "inner electrode member." Applicants respectfully disagree. The reference number 12 is not used to designate different parts in the drawings, but is used to designate the inner electrode member 12. As described at paragraph [0021] of the specification, "inner electrode member 12" is part of an upper electrode also including an outer electrode member 14. The upper electrode is an exemplary embodiment of the second member recited in Claim 1, for example. See Claim 7, which recites that "the second member comprises an inner silicon electrode and a segmented outer silicon electrode." Applicants submit that the drawings are consistent with the specification and claims with regard to the second member and inner electrode member 12 and outer electrode member 14. Should the Office disagree with Applicants' position stated above and in the December 11, 2006 Amendment, to expedite prosecution of this application, the Office is respectfully requested to indicate why Applicants' position is incorrect and to provide a suggestion as to how this objection can be overcome.

With regard to the other objections set forth in the Official Action, Applicants have also not used the same reference character (i.e., reference number "18", "22" or "24") to designate different parts shown in the drawings. Should the Office disagree with Applicants positions regarding any of the other objections, the Office is

respectfully requested to also provide a suggestion as to how such objection(s) can be overcome.

Rejections Under 35 U.S.C. § 103

Claims 1-5, 7-14, 16-21 and 28-30 stand rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,818,096 to Barnes et al. ("Barnes") in view of U.S. Patent No. 5,776,364 to Ishida et al. ("Ishida") and further in view of Japanese Publication No. 4316709 ("JP '709") for the reasons stated at numbered point (9) on pages 5-13 of the Office Action. The rejection is respectfully traversed.

Claim 1 recites a component of a plasma processing apparatus comprising a first member bonded to a second member, the first member including a plurality of through apertures having a first portion and a second portion wider than the first portion; and a plurality of first fastener members each mounted in an aperture of the first member, each first fastener member including a non-circular shaped head configured to prevent rotation of the first fastener members relative to the first member, the head having a bearing surface facing a surface that at least partially defines the second portion of the aperture.

The Office asserts that Barnes discloses a first member 1 (i.e., upper plate 1) bonded to a second member 8, 2 (i.e., outer ring 8, lower plate 2); and that the first member 1 includes a "plurality of through apertures (T-shaped hole for 18)" having a first portion and a second portion wider than the first portion. The Office further asserts that the first fastener members are T-nuts having a T-shape. Office Action at page 5, point (9). The Office acknowledges that Barnes does not teach "non-circular shaped" first fastener members.

However, the Office asserts that Nishimura discloses T-nuts 10 having a T-shape and that it would have been obvious to add such T-nuts to Barnes. Office Action at page 13, lines 1-3. Applicants note that JP '709 discloses a T-slot nut 10 shown in Figure 1.

Applicants submit that Barnes' does not disclose or suggest that the upper plate 1 includes "a plurality of through apertures having a first portion and a second portion wider than the first portion" (emphasis added), as recited in Claim 1. That is, the "through apertures" extend through the first member. For example, in the exemplary embodiment of the component shown in FIG. 3 of the present application, the backing ring 22 includes an aperture 36 extending through the backing ring 22. In contrast, the only "through opening" in Barnes' upper plate 1 is located in the center of the upper plate 1 shown in Figure 1. Thus, the upper plate cannot include a plurality of through apertures that have "a first portion and a second portion wider than the first portion," as recited in Claim 1. Furthermore, the Office has not established that Barnes discloses any "T-shaped hole" or "T-shaped nut."

Moreover, the Office has provided no motivation to modify Barnes' upper plate 1 to include "a plurality of through apertures having a first portion and a second portion wider than the first portion," much less a plurality of first fastener members each mounted in a through aperture of such first member, where each first fastener member includes a non-circular shaped head configured to prevent rotation of the first fastener members relative to the first member, and the head having a bearing surface facing a surface that at least partially defines the second portion of the aperture, as recited in Claim 1.

Thus, for at least the above reasons, the component recited in Claim 1 is patentable over the applied combination of references. Claims 2-5 and 7-9, which depend from Claim 1, are also patentable for at least the same reasons as those for which Claim 1 is patentable.

Claim 10, as amended, recites a component of a plasma processing apparatus comprising a second member including an attachment surface and an exposed surface adapted to be exposed to an interior of a plasma processing chamber; a first member including a first surface spaced from a second surface, the first surface contacting and being bonded to the attachment surface of the second member, the first member including axially extending apertures extending between the first surface and the second surface, each of the apertures including a first portion opening in the first surface and a second portion opening in the second surface, the first portion being wider in a transverse direction than the second portion; and T-nuts having a T-shape located in the second portions of the apertures (emphasis added).

At page 9, point (viii) (in the "Barnes does not teach" section - see page 8, line 1), the Office appears to assert that Barnes discloses a second member 3 (i.e., protective plate 3), including an "attachment surface" "2/3 interface" (i.e., interface between lower plate 2 and protective plate 3) and an "exposed surface" (lower surface of 3), and a first member 1 (i.e., upper plate 1) having a first surface (lowest surface of 1), bonded to the attachment surface. However, Barnes' lowest surface of upper plate 1 is not in contact with and bonded to the interface between the lower plate 2 and the protective plate 3, but is spaced from the top surface of lower plate 2 by a plenum chamber. Accordingly, Barnes does not suggest the features of "the

first surface contacting and being bonded to the attachment surface of the second member" recited in Claim 10.

Applicants submit that Ishida and JP '709 provide no suggestion or motivation to substantially modify the structure and principle of operation of Barnes' electrode to result in the component recited in Claim 10. At the least, such modification of Barnes' electrode would require removing the lower plate 1, plenum chamber 9, pins 4 and holes 24, 25, and thus would substantially change the principle of operation of Barnes' electrode. However, where a modification of a prior art reference would change the principle of operation of that reference, the applied references do not support a *prima facie* case of obviousness. See M.P.E.P. § 2143.01(VI); *In re Ratti*, 123 U.S.P.Q. 349 (C.C.P.A. 1959). In *Ratti*, the court stated that the "suggested combination of references would require ... [a] change in the basic principle of operation under which the [base reference] construction was designed to operate," and reversed the rejection under 35 U.S.C. § 103. *Ratti*, 123 U.S.P.Q. at 352.

Moreover, this modification of Barnes' electrode would result in the electrode being unable to achieve its intended function. Particularly, Barnes discloses that:

Plenum chamber 9 and insert 5 provide gas distribution that is adequate for wafer processing, with the necessary non-uniformity in that distribution (column 2, lines 31-33) (emphasis added).

According to Barnes, the plenum chamber 9 is a required element of the electrode to provide the necessary non-uniformity of gas distribution for wafer processing. Accordingly, the electrode would not be operable to achieve its intended purpose if modified as proposed by the Office. However, where a modification would render a prior art reference unable to achieve its intended purpose, the applied references provide no suggestion or motivation to modify the base reference in the

proposed manner. M.P.E.P. § 2143.01(V); *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

Thus, for at least the above reasons, the component recited in Claim 10 is patentable over the applied combination of references. Claims 11-14, 16 and 28, which depend from Claim 10, are also patentable for at least the same reasons as those for which Claim 10 is patentable.

Independent Claim 17, as amended, recites, *inter alia*, a showerhead electrode assembly for a plasma processing apparatus comprising a silicon showerhead electrode having gas injection openings and a plasma exposed surface; a graphite backing member secured to the silicon showerhead electrode, the backing member including a plurality of through apertures each having a first portion and a second portion wider than the first portion; a top plate including a plurality of through openings each of which is aligned with a respective aperture in the backing member; and a plurality of T-nuts having a T-shape, each T-nut being mounted in a respective aperture of the backing member, each T-nut including a bearing surface facing a surface at least partially defining the second portion of the apertures (emphasis added).

The Office asserts that Barnes discloses an electrode 7. However, Barnes discloses that element 7 is a lid including cooling channels 20 to provide cooling in the electrode structure. Barnes discloses that the lid 7 is made of an electrical conductor, such as aluminum. Barnes' electrode also includes a protective cover 3 and lower plate 2 including holes 24, 25 through which gas is distributed. Barnes discloses that RF energy is transmitted to lower plate 2 "so as to cause plasma to be

created below protective cover 3" (column 2, lines 38-40. Thus, the lower surface of the protective cover 3 is the plasma exposed surface of the Barnes' electrode.

The Office asserts that it would have been obvious to construct Barnes' electrode (i.e., lid 7) of silicon. Office Action at page 13, lines 2-3. Applicants submit that the applied combination of references provides no motivation to replace the water-cooled lid 7 of Barnes with a silicon showerhead electrode with gas injection openings and a plasma exposed surface. Barnes does not suggest that the lid 7 could be made from silicon, much less suggest any reason for making the lid 7 of silicon. Also, there is no motivation to introduce gas in an upward direction in Barnes' electrode through such gas injection openings, or to generate a plasma above the top of the electrode. As discussed above, Barnes' electrode is designed to produce plasma below the protective cover 3. The proposed modification of Barnes would, in effect, result in the electrode having two showerheads that introduce gas in opposite downward and upward directions. Applicants submit that this modification would render Barnes' electrode unable to achieve its intended purpose, and thus one skilled in the art would not have made such modification of Barnes' electrode. Thus, as discussed above, the applied references provide no suggestion or motivation to modify Barnes in the proposed manner.

Thus, for at least the above reasons, the showerhead electrode assembly recited in Claim 17 is patentable over the applied combination of references. Claims 18-21, 29 and 30, which depend from Claim 17, are also patentable for at least the same reasons as those for which Claim 17 is patentable.

Therefore, withdrawal of the rejection is respectfully requested.

Conclusion

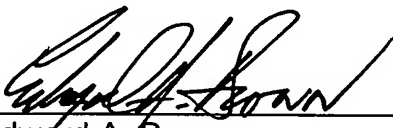
For the foregoing reasons, allowance of the application is respectfully requested. If there are any questions concerning this response, the Examiner is respectfully requested to contact the undersigned at the number given below.

Respectfully submitted,

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